Surface, Water and Air Biocharacterization (SWAB) Experiment

Technical Interchange Meeting

January 8, 2004

Purpose of TIM

- Action Item from Phase 0/I safety review to return to discuss levels of containment for the SWAB water collection bags and SWAB sample tubes.

Experiment Overview: Inflight

- Inflight samples will be collected within 48 hours of any launch vehicle docking with ISS.
  - **Collect at least three (3) water samples**
    - **1 liter of SRV-K hot water**
    - **1 liter of SRV-K cold water**
    - **1 liter of SVO-ZV potable water**
  - **Collect any free floating condensate**
  - **Collection of two surface samples for each available ISS module currently on orbit.**
  - **Sample of 1 m^3 of air for each of the available ISS modules currently on orbit.**

Experiment Hardware List

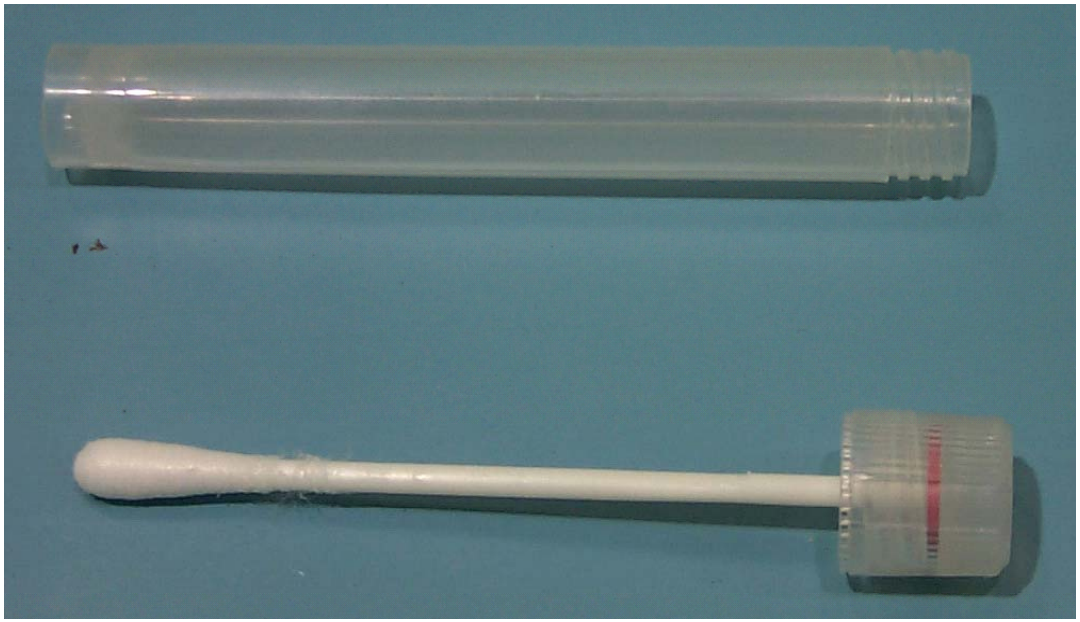
- Air Sampling:
  - Air Sampling Device (ASD)
  - ASD Battery Packs
  - ASD Filter unit
- Surface Sampling:
  - HRF SWAB Tube (Manufactured by Charm Sciences)
- Water Sampling:
  - Potable Adapter Probe Assembly (SRV-K hot/cold)
  - SVO-ZV Adapter Probe Assembly
  - SWAB Temporary Water Bag(s) and SWAB Final Water Bag(s)
  - Contingency Syringe (condensate collection)

Surface Sampling Hardware

- Surface samples will be obtained with a cotton swab and stored in a buffer for analysis upon return to Earth.
- The swab tube (swab in vial w/buffer) will be used for surface sampling. The buffer is used to limit the rapid growth or proliferation of unwanted microbes as well as prolong the sample life.
- **Buffer solution has been determined to be toxicity level 1 for eye irritation (critical hazard).**

Original Surface Sampling Hardware

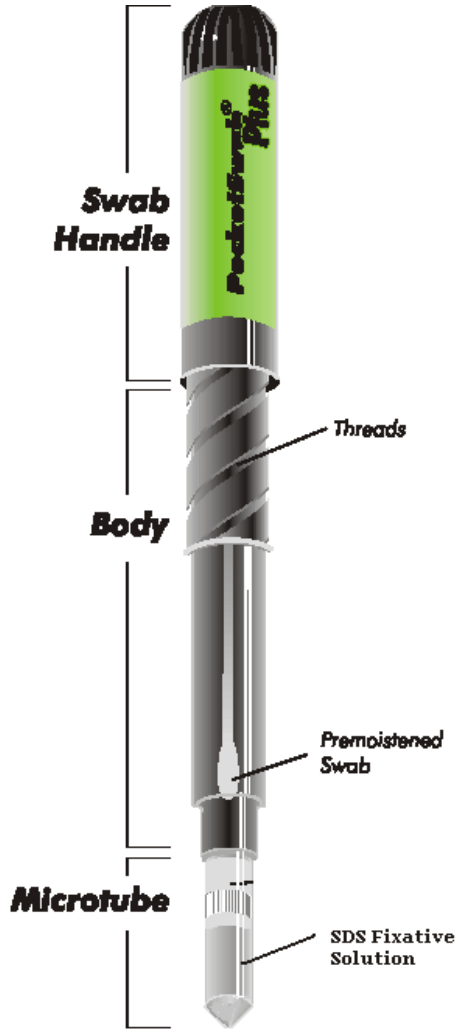
- Hardware selected prior to tox assessment, based on previous CHeCS hardware using identical buffer solution.



SWAB Surface Sampling Tube

Current Hardware Plans

- 2 levels of containment must be provided for 1ml of buffer solution.
- PocketSwab Plus
  - Provided with buffer solution in sealed portion of swab, sealed with foil seal
  - Launched in sealed ziplock
  - Removed for sample collection, swab pre-moistened with water
  - Buffer seal is punctured as swab is returned to body.
  - Replaced in ziplock following collection



Water Sampling Hardware

- The 1 liter water sample will be obtained with a specialized water port adapter which attaches the 1 liter sample bag to the ISS dispenser ports. The two water dispensing ports currently on the ISS require two different adapters.

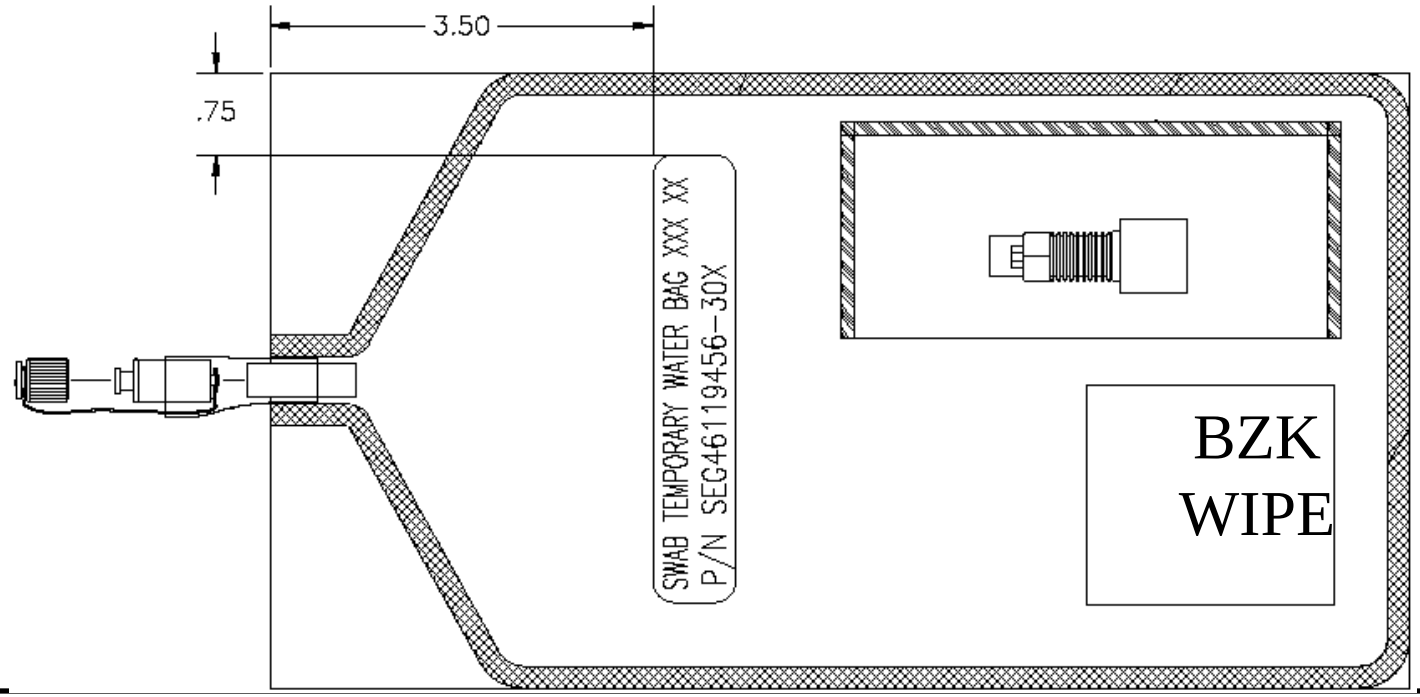
- Hardware:
  - Potable Water Adapter Probe - SRV-K (hot and cold) dispensing ports
  - SVO-ZV Adapter Probe - SVO-ZV dispensing port.
  - 2 Water bag system – One to collect water and another that contains the fixative that stores the water for transport back to earth.

- In the event there is free floating condensate in any of the ISS modules, a contingency syringe will be used to collect the sample and transfer it to one of the spare 1 liter sample bags.

- Water bag contains fixative powder that has been classified as **Tox level 2 for eye irritant and inhalation**.

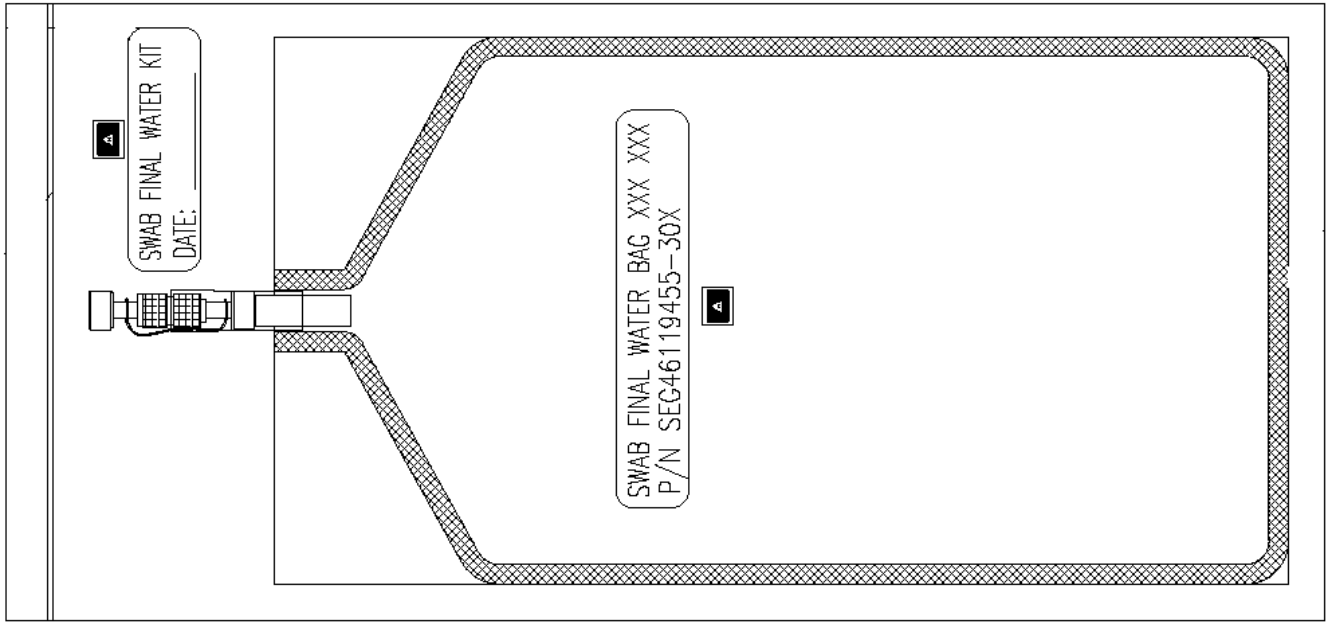
Water Sampling Hardware (Continued)

- SWAB Temporary Water Bag(s): This bag contains no fixative agent and will be connected to the water supply via the different adapter probes. A mechanically activated valve and cap are included on the inlet port.



Water Sampling Hardware (Concluded)

- SWAB Final Water Bag(s): This bag contains the fixative agent (tablets or water-soluble film bags) and will be connected to the Temporary Water Bag(s). The Final Bag is stowed inside a waterproof Bitran Bag during the transfer. A one-way valve and cap are included on the inlet port.



Implementation

- Tox level 2 powder would require 3 levels of containment.
- Tox level reduced to 0 if powder is in tablet form
- Final water bag is contained in a ziplock bag prior to sample collection. (film pouch provides 3rd level of containment)
- Water transfer is performed inside outer ziplock – approximately 5 minutes required for transfer
- Tox level is 1 after addition of water
- Water bag is 1 level of containment, outer ziplock bag is second level of containment.